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ABSTRACT

To investigate the affective and cognitive gains produced in an auto-tutorial world civilizations course, two groups of students were compared. A traditionally-taught (TT) section of 145 students and an auto-tutorially (AT) taught section of 140 were given pre- and posttests and used the same text and Modular Learning Program. The TT section achieved a higher pre-test mean score and showed a more positive attitude to the subject of history than the AT group. The TT section met three times weekly; the AT group met three times during the semester and were given a choice of three options for individual study. At the end of the experiment, the AT section had a higher mean score on the post-test and gave more positive evaluation of the course than those in the TT section. (SK)

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THE AFFECTIVE AND COGNITIVE GAINS MADE BY STUDENTS IN AN AUTO-TUTORIAL WORLD CIVILIZATIONS COURSE COMPARED WITH STUDENTS ENROLLED IN A TRADITIONALLY TAUGHT WORLD CIVILIZATIONS COURSE.

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The old adage that claims the best procedure for teaching involved the teacher at one end of the log and the student at the other, has some truth in it. If the teacher was aware of the individualities of the student and was able to accomodate them to the means of instruction, then the one to one relationship should have resulted in optimum learning for the student. If the teacher refused to acknowledge the individualities of the student at the other end of the log and insisted upon a means of instruction in dissonance with the student's learning skills, then optimum learning would have been greatly diminished and there would be no advantage to the one to one relationship. As a rule today, we smile at the notion of the one to one relationship as being unrealistic, uneconomic, and impractical. As teachers we claim we do not have the time nor energy to personalize instruction. Further, it is often argued, the time honored process of lecturing with some discussion is still the best way to teach history; it certainly is the predominant means of instruction and can be called the traditional way (TT).

If the TT class is closely examined, numerous serious flaws can be found. Let me give two. First and perhaps the most glaring flaw, is its dehumanizing element where teaching becomes what is done to the student by the teacher. This is often reflected in the observation that since the students really don't know much, the instructor must TELL them what they need to know. The important activity in the class is not TELLING but the student's learning and learning is what the learner does.[1] Second, the TT

1. Michael Brick & Earl J. McGrath, Innovation in Liberal Arts Colleges, (New York: Teachers College Press, 1966), p. 2.

class normally uses the bell curve, which condemns most of the class to mediocrity. It would be wise to stress mastery of the material to be learned and if the entire class should reach the level of mastery, all of them should earn A. If history is part of the humanities, why should a depersonalized rule such as the bell curve become the measure of the student? The learner ought to be at the very center of what we do and our role as teachers ought to be to facilitate the learning of each and every student who comes to us.

The great advantage of the one to one relationship of the log metaphor is the chance for the learner to experience individualized personalized learning and to gain a level of mastery of the data. To achieve this there are at least five principles that ought to be followed. They are:

1. The learner ought to be free of the usual time factor that constricts most courses.[2]
2. The learner ought to be able to use as many systems of learning as possible in order to master the data being presented.
3. The learner ought to be aware of his/her own learning skills and abilities so as to make better use of his/her potentiality through the various systems of learning available, and to augment his/her weaknesses in order to gain higher levels of learning.
4. The learner ought to know what is expected for mastery of the data and this expectation must be stated in clear unambiguous learning objectives.
5. Learners should not be forced tino a single system of learning but various systems of learning must be available to be fit to each individual.

These five principles are incorporated in the AT section of World Civilization on the campus of Northeast Missouri State University. For

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2. Barry Bloom, Evaluation and Comment, (Berkeley: University of California Press, 1960), Vol. 1, No. 2, p. 7. Bloom reports zero or negative correlation between grades earned and the amount of time spent on homework. He concludes that the time factor ought to be lifted from course work.

example, the AT section has a two year limit for completion of the course.[3] The second and third principles above involving student's learning skills and abilities, and providing a number of learning systems that can be matched to the individual student, are part and parcel of the AT section. The test in use to identify the individual student's learning skills is the Cognitive Style Map Instrument developed by Dr. Joseph E. Hill and his associates of Oakland Community College. The three main elements of this instrument - symbolic mediation, cultural determinants, and modes of inferences - include in part, the student's use of his senses; the ability to use certain kinds of theoretical and qualitative symbols such as words and numbers: the ability to listen and read; the ability to derive meaning from symbols in an individualistic, associative, or authoritative fashion; and the process used to make decisions, which includes thinking in terms of rules and principles, differences, relationships, deductions, and appraisal. These elements allow for 2,034 different combinations and constitute the cognitive style of the individual student. As soon as the cognitive map is available (computer-produced within twenty-four hours) it is interpreted for the student and suggestions are made as to how he or she will probably best succeed in the course through the use of the available systems of learning.

There are seven different systems of learning that can be adapted to the individual student. The seven include: the traditionally taught class; reading which includes the test and supplementary materials; audio-visuals which includes movies, filmstrips, audio-tapes, video-tapes, and 8mm loops; lectures put on an audio-tape with slides integrated into the text

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3. W.J.McKeachie, "Research on Teaching at the College Level," Handbook of Research on Teaching, ed. N.L.Gage, 1962. This article confirms the idea that time restrictions on a course are no longer valid if learning is the key motivating purpose for a course.

of the lectures; student interaction which includes discussion groups, games, and simulations; students teaching students; and the use of documents, artifacts, and Jackdaws. A student might use some, any combination of, or all of these systems. Accompanying the seven systems of learning is a flexible testing procedure involving open book multiple choice tests, essays, oral reports.[4]

The fourth principle is met through 1) the use of a clearly stated set of instructions which give the requirements for the various levels of grades, and 1) a modular learning program. This program consists of an outline of the text, a series of self-tests with answers, a tri-level set of learning objectives, and suggestions for further reading. The learning objectives are couched at the seventh level of Bloom's taxonomy as interpreted in Gronlund's Stating Behavioral Objectives. This was done in an effort to unambiguously state the learning objectives of the course. The first level gives the over-all learning objective for the unit, and it is usually divided into five to seven more specific learning objectives which constitutes the second level. The third level is the division of each of the second level objectives into single concepts. If the student does not understand the general first level learning objective or one of the second level objectives, the single concepts can be mastered and finally the second level and then the general objective for the unit.

For the past three years I have been in the process of developing and perfecting the individualized system of learning for world civilization or

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4. Paul Heist, ed., The Creative College Student: An Unmet Challenge (San Francisco: Jossey-Bass, 1968). Heist lists among the frustrations of creativity, the traditional grading techniques. This is avoided in the AT approach through the use of the flexible testing procedure where students have the chance to use the testing approach best showing their mastery of the data.

what is called Auto-Tutorial on our campus. Frequently those interested in this approach have asked how does this approach compare with the traditionally taught class. This year in an effort to gain some answers to this question, two of us who teach World Civilizations have engaged in an experiment to learn how the two approachs differ in the cognitive and affective domains. There were three null hypothesis posited:

1. There would be no significant differences between the two courses in the gain of post-test over pre-test scores.
2. There would be no significant differences in the student evaluations of the two courses.
3. There would be no significant differences in the attitudinal changes of the students toward the subject of history.

Much of the design of the experiment was pre-determined by the procedures established by the University's curriculum requirements and the Freshman Enrollment Office. Freshman and sophomore students are required to take one of the three sequence (two semester) courses in the Social Science Division to fulfill part of their general education requirements. Those who teach these three basic courses, U.S.Survey, World Civilizations, and Religion and Human Culture, have very little control over the size of their sections and the student composition of their section. This means that the students in the two groups were not randomly selected for this experiment. However both groups came from the same population. At the beginning of the semester both groups were about equal in size with 140 in the TT section and 145 in the AT section. They were about equally divided along male-female distribution. Both instructors used the same pre-test, the same text and Modular Learning Program, the same post-test and evaluative instruments. The AT section had a lower mean score on the pre-test than the TT section. Further,

the TT section was more positive toward the subject of history than the TT section at the beginning of the semester.

The TT section met three times per week for a 50 minute lecture and some discussion. The students in the TT section were tested six times during the semester through the use of four multiple choice tests and two essay tests. Attendance was taken and did figure in the grade earned by the student. The instructor had the use of a graduate assistant whose main responsibilities were to take attendance and to assist with the grading. At the end of the semester a curve was used for grading purposes and 7.5% earned A, 18% earned B, 39% earned C, 13% earned D, 7% earned F, and 16% Withdrew.

The AT section met three times during the semester; twice at the beginning for instructions and the administration of the pre-tests, and once at the end of the semester for the post-test and evaluations. In the course of the semester, the students could choose between Option A or Option B. Option A operated upon an assumption that when the requirements of a course were slightly reduced and the time factor halved, the students would learn as much as during the normal semester time span. In Option A, nine weeks long, the students had less to do and less time to do it in. They were asked to perform at 90% of mastery over thirteen chapter tests that were multiple choice in nature, to write two "A" essays plus four "A" evaluations of various forms of media available to them, and finally to earn at least a grade of 80% correct on the final for the grade of A for the course. Option B, a two year time limit, involved performance at the 90% level of mastery for the same thirteen chapter tests; the writing of four "A" essays and twelve "A" evaluations of the various forms of media plus at least 80% cor-

rect on the final exam to earn a grade of A. Since the course did not meet as a class, no attendance was taken. The instructor and the graduate assistant saw their main purpose to be to facilitate the learning of the students in the section. By the end of the semester, 47% earnd A, 35% earned B, 1% earned C, 0% earned D, 0% earned F, and 17% Withdrew.

The evaluation of the course was on a quadra-level basis. The study of history was evaluated on one part of the questionnaire; the method of instruction on another part; the third part measured other affective areas not covered on the first two parts; and the fourth, the post-test, provided the cognitive gain made by the students over the pre-test given at the beginning of the semester. A Chi Square Test was used to determine the significance of the responses of the students to the items and then a Gamma Test was used to gain further discrimination in their responses. This evaluation was the basis for testing the three null hypothesis.

The first null hypothesis stated there would be no statistically significant differences between the two sections on the post-test gain. The AT class pre-test mean was 23 out of 100 possible while the TT class mean was 31 on the same test. The post-test mean was 77 for the AT class and only 56 for the TT section. Thus the first null hypothesis was proven wrong and can be rejected. Those in the AT section more than tripled their pre-test score while those in the TT section did not double their score. Thus in the cognitive domain, the AT class did significantly better - they learned a great deal more.

The second null hypothesis, that there would be no significant differences in the evaluation of the two courses was partly correct and partly

incorrect. Over forty questions were answered by the students in the effort to prove this second null hypothesis. The questions covered the method of teaching, history as a subject, and other elements relative to the affective domain. Once the responses were tabulated, they were found to be statistically significant at the .001 level. Then the Gamma Test was applied to determine the importance of the responses. Of the fifteen questions directed toward their attitudes toward history, nine or 60% produced significant gamma results. The same basic results were found with the questions relating to the method of learning and also in the third sectionof the questionnaire. In the latter part, 67% or six of nine questions demonstrated significant gamma results with the gamma being over .40. In short the second null hypothesis was proven false and thus rejected. The AT secion and the TT section did not produce similar evaluations in the area of the affective domain.

To make this clearer, let us examine the questions asked and the responses made by the two groups. The following are the six questions from the survey that measured their attitudes toward history as a subject that were answered basically the same by both sections.

3. This class is only for those who will be teachers or for history majors.

	+	0	−
AT	21	21	58
TT	34	20	45

$\delta = .25$

5. History does teach you to think.

	+	0	−
AT	72	19	12
TT	65	18	18

$\delta = .14$

6. This history course should be eliminated as an offering at this university.

	+	0	-
AT	11	3	86
TT	11	16	72

$\chi = .33$

10. The subject matter of this history class is to mechanical and formalized.

	+	0	-
AT	33	19	49
TT	46	24	31

$\chi = .28$

13. This class in history has helped me develop an appreciation of the importance of the past to the present.

	+	0	-
AT	67	26	7
TT	60	17	23

$\chi = .23$

14. This history class has helped me appreciate the importance of history in daily living.

	+	0	-
AT	51	37	14
TT	39	31	30

$\chi = .27$

It is obvious the responses support history as a subject within the University's curriculum. Whether or not the course is taught in the TT or AT manner seems to have little bearing on the students' responses. However the majority of the responses to this part of the questionnaire present a different pattern and this pattern shows the teaching approach does make a significant difference.

1. This course in history should be required of all students for graduation.

	+	0	−
AT	51	19	31
TT	29	13	57

$\delta = .43$

2. I received experience in this history class that will be valuable for me allof my life.

	+	0	−
AT	60	35	5
TT	26	36	39

$\delta = .66$

4. This history course gave me my first real enthusiasm for history.

	+	0	−
AT	35	35	30
TT	8	21	70

$\delta = .70$

7. Most of the work for the class was valuable.

	+	0	−
AT	60	30	7
TT	31	35	21

$\delta = .49$

8. This class is the best class here in which creative thinking can be taught.

	+	0	−
AT	21	51	28
TT	8	18	74

$\delta = .67$

9. Only the brighter students benefit from this class in history.

	+	0	−
AT	9	7	84
TT	16	23	61

$\delta = .48$

11. This class has improved by ability to think logically.

	+	0	−	
AT	60	24	14	$\chi = .61$
TT	22	35	41	

12. I would recommend this course to anyone.

	+	0	−	
AT	71	16	5	$\chi = .78$
TT	28	32	40	

15. This course was excellent for the slower student who needed more repetition and prodding than most.

	+	0	−	
AT	70	16	4	$\chi = .86$
TT	18	31	50	

The responses to the AT section are significantly more positive than those of the TT section. As can be seen in the distribution of the responses, which are in percentages, the AT class tends to respond in the opposite manner from those in the TT section. This was most pronounced for questions 1,2,4,8,11,12,15. In other words in these questions where AT section responses were significantly positive, the TT section's responses were negative.

A similar situation developed in the responses to the questions that dealt with the method of teaching history. In seven questions or 47% of the time, the two methods of instruction elicited remarkably similar results. For example:

17. I would have like to ask more questions during the semester.

	+	0	−	
AT	26	40	30	$\chi = .24$
TT	42	29	24	

19. The grading has been fair this semester.

	+	0	−
AT	67	19	14
TT	53	28	17

$\chi = .22$

20. There was a lot of class time wasted this semester.

	+	0	−
AT	12	16	70
TT	31	13	55

$\chi = .35$

21. I wasn't able to keep up with the other students.

	+	0	−
AT	9	28	63
TT	14	19	63

$\chi = .006$

28. There was too much emphasis on things that weren't important.

	+	0	−
AT	16	40	42
TT	39	25	34

$\chi = .30$

29. There was too much outside work required this semester.

	+	0	−
AT	21	19	58
TT	14	17	66

$\chi = .18$

30. It was too easy for the slacker to get by this semester.

	+	0	−
AT	19	12	65
TT	15	18	65

$\chi = .006$

These responses are not significantly different but the responses are of the character one would hope to achieve in any history class. However the majority of the questions present a different pattern that shows the strength of the AT section over the TT section.

16. I like the way history was taught this semester

	+	0	−
AT	86	7	5
TT	22	26	47

$\delta = .89$

18. I knew how I was doing all semester

	+	0	−
AT	74	16	9
TT	44	13	41

$\delta = .59$

22. It took too long to get my test papers back.

	+	0	−
AT	12	14	74
TT	33	14	50

$\delta = .46$

23. We covered the subject too fast.

	+	0	−
AT	9	19	70
TT	37	22	39

$\delta = .58$

24. I believe too much written work was required this semester.

	+	0	−
AT	21	35	44
TT	8	11	81

$\delta = .62$

25. I had plenty of opportunity to work on my own this semester.

	+	0	-
AT	81	9	11
TT	56	20	20

$\delta = .44$

26. I worked more in history than in my other classes.

	+	0	-
AT	37	32	28
TT	25	16	57

$\delta = .40$

27. I think more use of teaching materials would have helped.

	+	0	-
AT	25	30	44
TT	59	25	14

$\delta = .59$

The responses to the AT section are significantly stronger than those in the TT section. Either the students in the AT section responded in reverse to those in the TT section or the former's responses were significantly higher to warrant a higher gamma. In either instance the responses of the AT section demonstrate more positiveness in the area of the affective domain than those in the TT section.

The last nine questions presented a configuration in which the AT section dominated the TT section's responses. In three instances there were no statistically significant differences in the way in which the two sections responded to the questions.

34. Was the amount of time you spent on the class more, same, less than what you spent on your other classes.

	+	0	-
AT	28	37	26
TT	16	49	27

$\delta = .16$

45. Do you think you understand your world better now as a result of this course.

	+	0	−
AT	65	30	0
TT	50	40	5

$\delta = .34$

47. Did you like history before taking this course.

	+	0	−
AT	47	12	30
TT	53	22	18

$\delta = .16$

The remaining six responses put the AT section in a very positive light.

For example:

35. Have you found this class more, same, less difficult than your other classes.

	+	0	−
AT	16	47	28
TT	44	36	11

$\delta = .54$

36. Would you recommend this class to your friends.

	+	0	−
AT	81	7	12
TT	26	40	27

$\delta = .70$

37. Have you learned more in this class than in your other classes.

	+	0	−
AT	40	42	7
TT	13	33	41

$\delta = .73$

38. If you had a choice between this type of class and a traditionally taught class, which would you choose. (This was worded in reverse order for the TT section.)

	+	0	−
AT	91	5	5
TT	24	61	8

$\delta = .84$

42. Are you satisfied with the evaluation of your work.

	+	0	−
AT	70	16	9
TT	24	36	34

$\delta = .71$

48. Has your attitude changed toward history as a result of taking this course.

	+	0	−
AT	40	35	0
TT	16	46	12

$\delta = .66$

In most of the above instances the gamma represents a significantly higher response on the part of the AT section. This was true for questions 36, 38, 42, 48. For questions 35, 37, the responses were reversed. In question 35 more of the TT section found their section more difficult than those in the AT section and more AT students found their section less difficult than those in the TT section. This can be explained in part by the fact that when students are succeeding in a class and feel the class is relevent, they find it to be of less difficulty than one in which they are bored or they find the class to be meaningless to them. The responses of the students to question 37 are quite significant in that more in the AT section felt they learned more than those in the TT section. This tends to

support the position taken in relation to question 35 above.[5] In summary, the second null hypothesis was in error and rejected since in the students' responses, the AT section received more statistically significant positive responses than the TT section.

It is apparent by now that the third null hypothesis is false and must be rejected. The students in the AT section began the semester more negative toward history than those in the TT section by by the end of the semester, 40% of the AT negative students had become positive and none became more negative while in the TT section, only 16% who had been negative became more positive while 12% actually became more negative toward history.

On the basis of the data presented in this study involving approximately equal populations, it can be concluded that:

1. The students in the AT section learned more than those in the TT section.
2. The students in the AT section gave more positive evaluations of the course than those in the TT section.
3. More of the students in the AT section who had begun the class negative toward history became more positive to the study of history by the end of the course while those in the TT section tended to retain their pre-course attitudes.

The implications of this study are important for the history profession. The TT sections have a place in the curriculum but not the dominant place heretofore enjoyed by them. If the purpose of the history course is to learn the facts of history and how to interpret them in a meaningful manner,

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5. R. White, "Motivation Reconsidered: The Concept of Competition", Psychology Review, Vol. 66, 1959, p. 297-353, where the same basic idea is presented.

the AT approach seems to accomplish this much more effectively than the TT approach. This study shows that AT can bring about a more positive change toward the study of history than the TT approach. Unless there is a greater positive change in the affective domain at the freshman and sophomore levels, the history profession will probably experience a decline in enrollment at the upper levels of study which will compound an already difficult situation. Thus, AT ought to become the predominant means of teaching history at least at the early levels of college and university student experience.